

Appendix 11: Seven Common Types of Forested Wetlands

Forestry operations and applicable BMPs may differ among wetland types, so a wetland classification system is outlined below. The classification system used here is based on the hydrogeomorphic (HGM) classification system developed by the USACE (Brinson, 1993; Smith et al., 1995). Seven standard wetland types that apply nationally are described, based on geomorphic setting and hydrologic character. The seven types are briefly described below (listed alphabetically) in order to provide a framework for understanding BMPs that may be appropriate to one or more wetland types.

Common names applied to wetlands vary widely and are not standardized enough to use as the basis of a classification system. However, the common names often used by foresters and ecologists for many forested and non-forested wetland subtypes within each wetland type are also provided for reference.

Past hydrologic alterations such as large reservoirs that altered flooding regimes in river bottomlands, stream channelization that limited flooding on small streams, and land drainage that altered water table regimes may have caused wetland areas to become wetter or drier. In such situations, the soil condition may be different than described in the county soil survey. Onsite assessment of wetland condition should consider the effects of such hydrologic alterations.

Depressional Wetlands

- Description:** Occur in topographic depressions with a closed elevation contour that allows accumulation of surface water. Usually do not have channel inlets and outlets and commonly occur as inclusions in nonwetland forests.
- Hydrology:** Influenced by groundwater discharge and interflow from the adjacent uplands, and often, restrictive soil layers that limit seepage downward.
- Size:** Relatively small (from 0.01 to a few acres), other than Carolina Bays. Carolina Bays range in size from a few acres to several thousand acres. Many have stream outlets, and may have mineral or organic soils or complexes of both.
- Soils:** Soils are usually mineral
- Common Name Sub-types:** Coastal Plain depressions (Coastal Plain ponds, Coastal Plain sinkholes), maritime depressions (on Outer Banks), perched wetlands (ephemeral wetlands, or vernal pools - small depressional wetlands that occur in forested areas throughout the Piedmont and Mountains).

Lacustrine Fringe Wetlands

- Description:** Adjacent to lakes where the water elevation of the lake maintains the water table in the wetland.
- Hydrology:** Influenced by groundwater discharge and interflow from the adjacent uplands, and occasionally, subsurface flow from the lake back into the shoreline soil. During wet periods, the groundwater hydraulic gradient is from land to lake and water flows through the wetland soil are from land to lake. During periods of high evapotranspiration rates, the water table in the wetland may often decline below the lake water level and water flow through the wetland soil is from lake to land.
- Size:** Dependant upon size of lake
- Soils:** Soils may be mineral or organic.
- Common Name Sub-types:** Lacustrine fringe wetlands occur on the shorelines of ponds, lakes, and reservoirs throughout the state with vegetation types ranging from open herbaceous marsh, to mixed hardwoods, or cypress.

Mineral Flat Wetlands

- Description:** Very low relief, usually relatively large areas in the Coastal Plain that occur on flat interstream uplands or large flood plain terraces
- Hydrology:** Influenced by low relief and slowly permeable soil layers that limit rates of runoff and downward seepage. Precipitation is the only source of water for mineral flat wetlands that occur on high terrain areas. Subsurface groundwater input influences hydrology where adjacent uplands are at higher elevation than the wetland.
- Size:** From tens up to hundreds or thousands of acres
- Soils:** Mineral soils only. As a result, the texture of the soil surface layers may range from sandy texture with very low organic carbon content to shallow organic layers (histic epipedon) up to 15" thick.
- Common Name Sub-types:** Wet pine flats-mineral (including drained and undrained pine plantations), wet hardwood flats, non-riverine swamp forest (mineral soils), wet pine savanna, mixed pine-hardwood flats

Organic Flat Wetlands

- Description:** Very low relief, usually relatively large areas in the Coastal Plain that are similar in geomorphic locations and hydrologic character to mineral flat wetlands except that wetter conditions have resulted in the development of organic soils.
- Hydrology:** Direction of runoff is horizontally outward in all directions in large domed peatlands, but may flow across in some organic soil flats.
- Size:** From tens up to hundreds or thousands of acres
- Soils:** Soils have a surface or near surface layer of organic soil material that is 16" or more thick
- Common Name Sub-types:** Pocosins, wet pine flats-organic (including drained and undrained pine plantations), white cedar forest, nonriverine swamp forest (organic soils)

Riverine Wetlands

- Description:** Occur in riparian zones and flood plains along stream channels throughout the state
- Hydrology:** Influenced by groundwater discharge and inter-flow from the adjacent uplands and overbank flow from the stream in areas that sustain frequent, long duration flooding
- Size:** Range in size from small inclusions (down to 0.01 ac.) in nonwetland riparian zones in the Piedmont and Mountains to extensive floodplain swamps in the Coastal Plain (up to hundreds or thousands of acres).
- Soils:** Both mineral and organic hydric soils occur. Note that many bottomland hardwood forests occur on somewhat poorly drained soils to well-drained soils that are nonhydric, but it is recommended that all BMPs described in this chapter be utilized for forestry operations on floodplains.
- Common Name Sub-types:** Wet headwaters forests, wet bottomland hardwoods, mountain bogs and bog forests, blackriver bottom forest, muck swamps, gum-cypress swamps

Slope Wetlands

- Description:** Normally found on sloping terrain where there is a discharge of groundwater to the land surface, usually due to a restrictive layer in the soil
- Hydrology:** The surface runoff of water from large slope wetlands often forms channels that are the origins of first order streams and the slope wetland may transition to riverine wetlands along the stream.
- Size:** Slope wetlands or seeps are usually small, much less than an acre, but may range up to several acres in size.
- Soils:** Soils are usually mineral
- Common Name Sub-types:** Usually occur as small inclusions in nonwetland forested areas throughout the upper Coastal Plain, Piedmont, and Mountains

Tidal Fringe Wetlands

- Description:** Occur along sea coasts and sound or estuary shorelines and are under the influence of sea level and regular lunar tide cycles.
- Hydrology:** Intergrade with riverine wetlands in estuaries where tidal currents diminish and river flow is constantly downstream. In North Carolina, the tidal fringe wetlands along the sound shorelines are also influenced by irregular wind tides.
- Size:** Subject to bi-directional subsurface and surface flow, the pattern of which is controlled by the tidal pattern.
- Soils:** Soils may be mineral or organic.
- Common Name Sub-types:** Tidal hardwoods, tidal gum-cypress swamp, and tidal marshes of various types, depending on water salinity. Coastal Wetlands as defined in NC G.S. 113-229(n)(3) are a subset of tidal marshes that contain 1 or more, of 10 marsh grass species.